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## PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

January 30–February 26, 1938

The accompanying table summarizes the prevalence of eight important communicable diseases based on weekly telegraphic reports from State health departments. The reports from each State are published in the PUBLIC HEALTH REPORTS under the section "Prevalence of Disease." The table gives the number of cases of these diseases for the 4-week period ending February 26, the number reported for the corresponding period in 1937, and the median number for the years 1933–37.

### DISEASES ABOVE MEDIAN PREVALENCE

*Measles.*—The current epidemic of measles, the beginning of which was first noticed about November 1, 1937, is now practically as severe as the outbreaks of 1934 and 1935. The present outbreak started

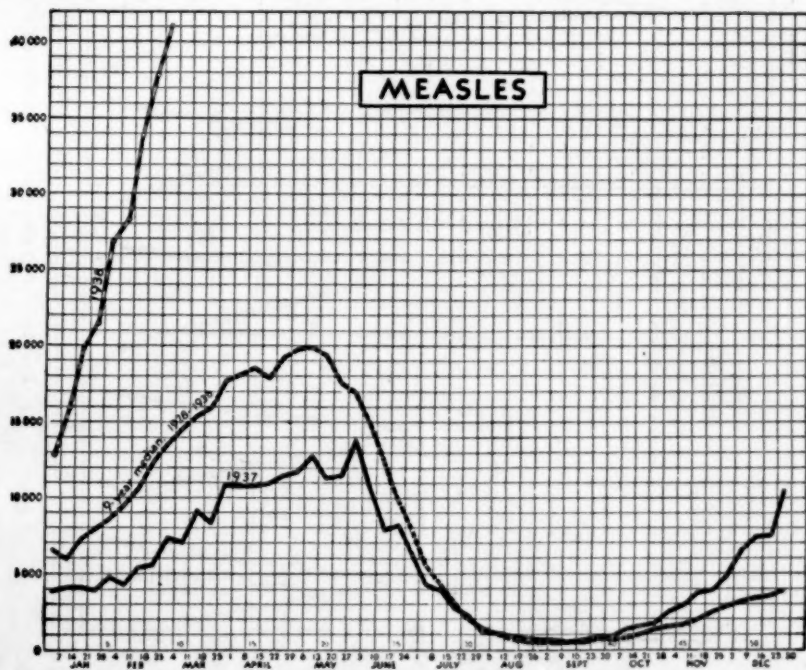


FIGURE 1.—Numbers of reported cases of measles by weeks for 1937 and 1938 and the median number of cases for the 9 years 1928-36.

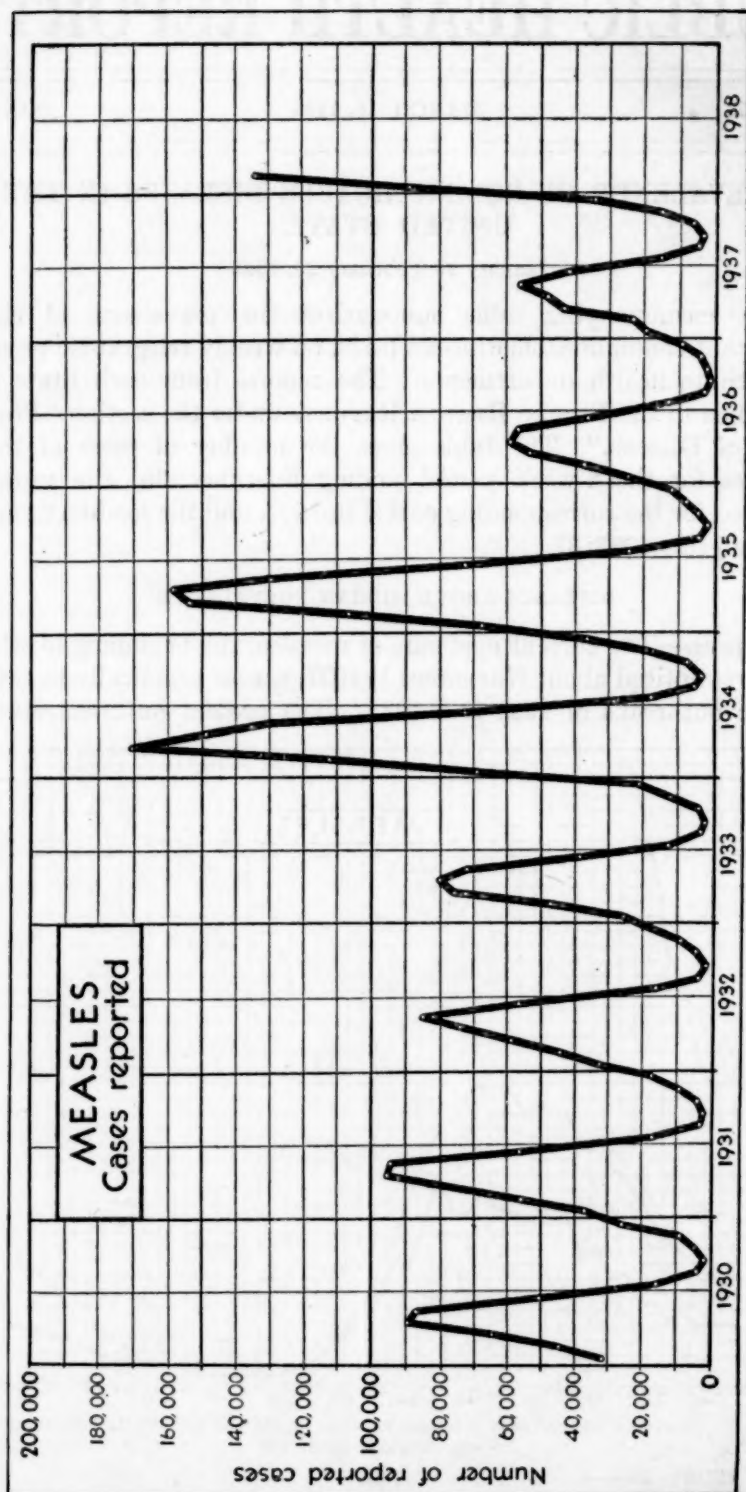


FIGURE 2.—Number of cases of measles reported by months, January 1930-February 1938.

slightly earlier in the fall than did the last two outbreaks, which occurred in 1934 and 1935, and during February was already as severe as the latter were during March and April. The number of reported cases is still increasing, and so it seems likely that the present epidemic will be more severe than the two previous ones. In any case, the current number of cases is several times greater than the median number reported for the period 1928-36 (fig. 1).

The incidence is especially high in the Middle Atlantic, East North Central, and South Atlantic regions; more than 80 percent of the total number of cases was reported from these areas. The East North Central States, Ohio, Indiana, Michigan, Illinois, and Wisconsin, with about 20 percent of the total population, reported 44 percent of the cases of measles for the week ending March 5.

The New England and Pacific Coast States are unusually free from this disease; less than one-half the usual number of cases for this time of year were reported from these areas.

*Poliomyelitis.*—The number of reported cases of poliomyelitis was about 10 percent above that for the corresponding period in 1937 but nearly 30 percent in excess of the average number reported during the preceding 5 years. A definite increase over the seasonal expectancy was reported from the South Atlantic, East South Central, and Mountain regions, but in other regions the incidence was about normal for this season. The South Atlantic and South Central regions also reported a relatively high incidence at this time in 1937.

*Typhoid and paratyphoid fever.*—Owing mainly to an unusually large number of cases reported in Louisiana (69) and Texas (62), the incidence of typhoid fever during the current 4-week period was nearly 10 percent greater than the number expected for this time of the year. Except in the West South Central region, however, the number of cases of typhoid fever was about normal.

*Smallpox.*—The number of cases of smallpox (2,241) reported for the current period was 1.8 times the number reported for this period in 1937 and almost 3 times the average number reported for the years 1933-37. It is the highest incidence of this disease since 1931, when there were approximately 4,100 cases during the corresponding period. The high incidence of smallpox started in the West and has been mostly confined to that territory. Recently, it has spread to all sections of the country except the Atlantic Coast regions.

Number of reported cases of 8 communicable diseases in the United States during the 4-week period Jan. 30-Feb. 26, 1938, the number for the corresponding period in 1937, and the median number of cases for the corresponding period 1933-37<sup>1</sup>

Division	Current period	1937	5- year median	Current period	1937	5- year median	Current period	1937	5- year median	Current period	1937	5- year median
	Diphtheria			Influenza <sup>2</sup>			Measles <sup>3</sup>			Meningococcus meningitis		
United States <sup>1</sup> .....	2,436	2,069	2,874	12,990	100,088	28,552	134,607	20,878	42,415	378	678	525
New England.....	36	43	62	76	4,486	143	2,410	6,319	5,686	12	24	9
Middle Atlantic.....	414	394	394	131	703	287	42,069	5,818	11,883	60	112	49
East North Central.....	553	384	531	397	6,121	2,532	51,204	660	7,553	38	98	98
West North Central.....	196	146	286	536	10,804	1,802	6,372	210	8,931	28	54	54
South Atlantic.....	397	429	425	2,995	15,524	8,761	17,732	3,600	5,067	79	137	63
East South Central.....	178	192	225	1,996	8,775	3,630	8,767	614	710	98	94	81
West South Central.....	400	296	433	5,299	25,132	3,769	2,338	1,646	1,667	38	83	43
Mountain.....	116	61	71	585	6,227	1,402	2,628	1,442	1,442	9	18	23
Pacific.....	146	124	191	675	22,816	2,390	1,087	569	2,764	16	58	18
	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and para- typhoid fever		
United States <sup>1</sup> .....	89	80	66	24,290	26,877	26,877	2,241	1,220	754	523	390	481
New England.....	2	1	1	1,893	1,897	1,585	0	0	1	16	11	14
Middle Atlantic.....	5	5	7	5,682	6,997	6,708	0	11	0	54	55	57
East North Central.....	9	11	11	8,245	8,767	9,057	803	196	130	86	44	70
West North Central.....	4	7	5	3,765	5,180	2,200	661	689	257	36	15	31
South Atlantic.....	17	18	9	1,034	895	1,004	11	5	4	85	85	85
East South Central.....	19	23	6	615	614	556	193	9	9	37	64	58
West South Central.....	9	11	6	844	318	549	268	36	184	153	77	77
Mountain.....	8	1	2	897	857	857	193	126	72	27	19	17
Pacific.....	16	3	16	1,315	1,352	1,406	412	148	148	29	20	34

<sup>1</sup> 48 States. Nevada is excluded and the District of Columbia is counted as a State in these reports.

<sup>2</sup> 44 States and New York City.

<sup>3</sup> 46 States. Mississippi and Georgia are not included.

#### DISEASES BELOW MEDIAN PREVALENCE

*Scarlet fever.*—The 24,290 cases of scarlet fever reported during the current period are about 10 percent below the seasonal expectancy. In the New England, West North Central, and West South Central regions the incidence was considerably above the median, while the Middle Atlantic and East North Central regions reported a relatively low incidence and other regions reported about the normal seasonal incidence.

*Diphtheria.*—The incidence of diphtheria (2,436 cases) is slightly in excess of that recorded for the corresponding period in each of the 2 preceding years but it is considerably below the 1933-37 average. The greatest increases over last year were reported from the North Central, West South Central, and Mountain regions; but only the Mountain States reported any definite increase over the expected seasonal incidence.

*Meningococcus meningitis.*—The incidence of meningococcus meningitis is relatively low. The 378 cases reported for the 4 weeks ending February 26 was less than 60 percent of the number reported for the corresponding period in 1937 and about 70 percent of the 1933-37 average. In the Middle Atlantic and East South Central regions the



incidence was somewhat above the normal seasonal expectancy, but in other regions the incidence either closely approximated the average or fell considerably below it.

*Influenza.*—The number of cases of influenza reported for the current 4-week period (12,990) is unusually low compared with the number reported during 1937, 1936, and 1935, approximately 100,000, 28,000, and 25,000, respectively. The current incidence is approximately equal to that in 1934 (13,041 cases), a year unusually free from influenza. The disease was somewhat above the median level in the West South Central region, but in all other regions the incidence was relatively low.

#### MORTALITY, ALL CAUSES

The average mortality rate per 1,000 population from all causes in large cities for the 4 weeks ending February 26, based on data received from the Bureau of the Census, was 12.0. The rate was the lowest for the corresponding period in the 13 years for which these data are available, and was no doubt due largely to the low incidence of influenza during the winter months. In 1937 the rate for this period was 14.3 and in 1936 it was 13.8.

### History and Frequency of Clinical Scarlet Fever Cases and of Injections for Artificial Immunization Among 9,000 Families, Based on Nation-Wide Periodic Canvasses, 1928-31\*

By SELWYN D. COLLINS, *Principal Statistician, United States Public Health Service*

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The trend of scarlet fever mortality in Massachusetts is available back to 1842 (15 (1928), p. 99). In the 20 years from 1855 to 1874,

\*From Statistical Investigations, Division of Public Health Methods, National Institute of Health, U. S. Public Health Service.

This is the tenth of a series of papers on sickness and medical care in this group of families (1-9). The survey of these families was organized and conducted by the Committee on the Costs of Medical Care; the tabulation was done under a cooperative arrangement between the Committee and the Public Health Service. Committee publications based on the results deal primarily with costs and Public Health Service publications primarily with the incidence of illness and the extent and kind of medical care, without regard to cost. As costs are meaningless without some knowledge of the extent and nature of the service received, there is inevitably some overlapping. The Committee staff, particularly Dr. I. S. Falk and Miss Margaret Klem, cooperated in the tabulation of the data.

Special thanks are due to Dr. Mary Gover, who assisted in the analysis, to Mrs. Lily Vanzee Welch, who was in immediate charge of tabulating the data, and to other members of the statistical staff of the Public Health Service for advice and assistance in the preparation of the study. I am indebted also to Dr. W. H. Frost, of the Johns Hopkins School of Hygiene and Public Health, for many helpful suggestions.

death rates from this cause in Massachusetts fluctuated around an average of 86 per 100,000 population, with a peak rate of 173 in 1857 and with rates above 100 for 5 of the 20 years. Aside from waves of high and low rates, which appear in nearly all of the communicable diseases of childhood, there has been a downward trend in scarlet fever mortality since 1875; the rate in 1934 was 1.8 and the average annual rate for the 5-year period, 1930-34, was 2.5 per 100,000.

The trend of scarlet fever mortality in the original registration States<sup>1</sup> roughly parallels that in Massachusetts; the death rate in these States in 1900 was 9.6 per 100,000, with an average for the 5 years 1900-1904 of 11.8. In 1934 the rate in the same States<sup>2</sup> was 2.0, and the average annual rate for the 5-year period 1930-34 was 2.1 per 100,000. The consensus of medical opinion probably is that the virulence of scarlet fever has gradually decreased, with a resulting decline in case fatality (20, 31). There is no evidence that the incidence of the disease as represented by the annual case rate has declined in recent years.

A method of immunizing against scarlet fever was described by the Dicks in 1924 (23, 24), or about 5 years prior to the first year for which the data were collected for this study. Further developments<sup>3</sup> have taken place (32, 33), but the whole immunizing procedure for scarlet fever may be said to be still in the early if not the experimental stages. However, it is of interest to consider the extent to which the process has been used in the general population.

#### I. SOURCE AND CHARACTER OF DATA

In the study of illness in canvassed white families in 130 localities in 18 States<sup>4</sup> that was made by the Committee on the Costs of Medical Care (28) and the United States Public Health Service, all service received from physicians and other practitioners was recorded, whether for illness, immunization, physical examination or other reasons. The records of injections for immunization<sup>5</sup> against scarlet fever for all persons in the observed population afford data on the frequency of this procedure during 12 months covered by periodic

<sup>1</sup> The original registration States of 1900 include Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Michigan, Indiana, and the District of Columbia.

<sup>2</sup> The rate for the total continental United States was the same, 2.0 per 100,000 in 1934.

<sup>3</sup> The history of the development and present status of scarlet fever immunization procedures are reviewed in a recent article by Fraser (26).

<sup>4</sup> The 18 States sampled and the number of canvassed families were: California (890), Colorado (386), Connecticut (100), District of Columbia (99), Georgia (544), Illinois (463), Indiana (494), Kansas (301), Massachusetts (287), Michigan (329), Minnesota (224), New York (1710), Ohio (1148), Tennessee (212), Virginia (412), Washington (551), West Virginia (318), Wisconsin (290). Further details about the distribution of the canvassed population are included in a preceding paper (1).

<sup>5</sup> "Immunization" is used in this paper to mean the injection of the usual number of doses of scarlet fever immunizing material. All cases receiving such service are designated as "immunizations"; no data are available on Dick tests following the injections to indicate whether the process actually changed the skin test or produced immunity in the individual.

canvasses. Information was also obtained on the history of clinical cases and of injections for immunizing against scarlet fever at any time prior to the study.

The composition and characteristics of the group of 8,758 families which were kept under observation for 12 consecutive months in the years 1928-31 have been considered in some detail in the first report in the series (1). These families, including a total of 39,185 individuals, resided in 18 States representing all geographic sections. Every size of community was included, from metropolitan districts to small industrial and agricultural towns and rural unincorporated areas. With respect to income, the distribution was reasonably similar to the estimated distribution of the general population of the United States at the time of the survey.

The method of the study required, among other things, that local visiting nurses from health departments and other agencies make the canvasses of the homes to secure the data. A process of selection obviously entered here, since each locality that was included had a visiting nurse employed by a local health department or some other agency. In such communities a larger percentage of the population may have received the immunizing injections than in those without nursing service and health organizations. On the other hand, since the report for the whole family was made by the housewife or some other adult female, the record of immunizations may be less complete than could be obtained by the questioning of individuals.

## II. HISTORY OF CLINICAL CASES AND OF INJECTIONS FOR IMMUNIZATION PRIOR TO THE STUDY YEAR

Table 1 and figure 1 show for specific ages the proportion of individuals who were reported as having received injections for immunizing against scarlet fever, and the proportion who had suffered clinical attacks of the disease at any time in their lives. For adults the record of childhood attacks of a mild disease is probably incomplete because of forgotten cases, particularly for noninformants in the household; the data on the history of scarlet fever include only the ages under 25 years and it is doubtful whether the reports are complete above 15 or 20 years.

The percentage who reported a history of injections for immunization against scarlet fever is small as compared with the history of clinical attacks, but surprisingly large for a procedure that had been available for so few years and that had not been widely advocated by health departments. The more accurate record of the numbers who received the injections during the study year would accumulate to a percentage that is less than half of that reported for the years prior to the study. The newness of the procedure may have resulted in con-

TABLE 1.—History of scarlet fever immunizations and cases among persons of specific ages of each sex—canvassed white families in 18 States <sup>1</sup>

Age in years	Both sexes				Percentage of persons with history of—				Total number of persons considered	
	Percentage of persons with history of—			Total number of persons considered	Immunization at any time but no case		Case at any time			
	Immunization or case at any time	Immunization at any time but no case <sup>1</sup>	Case at any time		Male	Female	Male	Female		
									Male	Female
All ages under 25...	10.98	2.67	8.31	20,482	2.58	2.75	7.66	8.94	10,116	10,366
Under 1.....	0.65	.66	.11	919	.55	.78	.45	.45	915	893
1.....	1.12		.34	889						
2.....	3.54	2.02	1.25	1,044	2.38	1.65	2.01	1.93	1,093	1,034
3.....	4.43		2.68	1,083						
4.....	6.18	2.26	3.97	1,133	2.19	2.32	4.75	4.04	1,138	1,163
5.....	7.11		4.79	1,168						
6.....	8.55	3.09	5.79	1,158	3.12	3.06	6.42	7.34	1,184	1,144
7.....	11.37		7.95	1,170						
8.....	11.22	3.67	7.72	1,204	3.36	3.97	8.84	8.55	1,075	1,134
9.....	13.73		9.85	1,005						
10-11.....	15.78	4.05	11.73	1,978	3.45	4.02	10.92	13.59	2,298	2,267
12-14.....	16.13	3.49	12.64	2,587	3.09	2.84	11.95	14.00	1,523	1,514
15-19.....	15.94	2.97	12.97	3,037	.68	1.64	10.67	12.74	890	1,217
20-24.....	13.10	1.23	11.87	2,107						

<sup>1</sup> Dates of interviews varied from 1928 to 1931. Data refer to histories at the beginning of the 12-month morbidity study.

<sup>2</sup> Immunization history rates for older age groups were as follows: 25-44 years, 1.42 percent; 45 years and over, 0.59 percent.

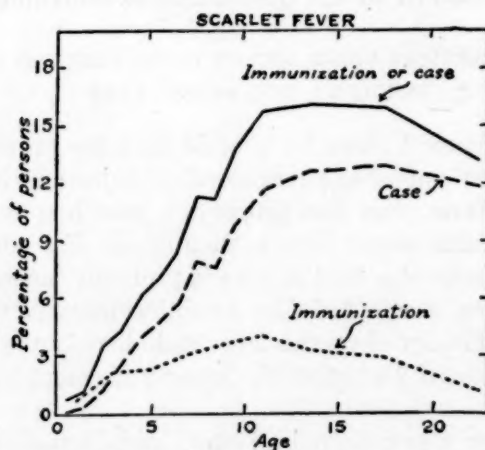


FIGURE 1.—Percentage of persons of specific ages (a) who had received injections for immunization and (b) who had suffered an attack of scarlet fever—8,758 canvassed white families in 18 States, 1928-31.

fusion with Dick tests, and thus led to an overreporting of histories of injections in preceding years.

As reported by the families, 0.7 percent of children under 2 years of age had received the injections prior to the study; the curve rises as age increases to a maximum of 4.1 percent at 10-11 years with a

decline thereafter to 1.2 percent at 20-24 years.<sup>6</sup> This curve represents the reported history of injections for artificial immunization at any time in the past and therefore is cumulative in nature. Two circumstances account for the decrease in the adult ages: (a) injections for artificial immunization against scarlet fever have come into use only recently, and (b) adults are seldom given the injections as the great majority have become immune by natural processes.

The percentage of children with a history of a clinically recognized and remembered attack of scarlet fever was large as compared with the percentage artificially immunized; therefore the curve (fig. 1) for the total with a history of a clinical case or injections for immunization is similar to that for cases of scarlet fever.

None of these curves represents the total percentage with immunity to scarlet fever because Dick tests indicate that a large proportion of persons, particularly older children and adults, are relatively immune to scarlet fever without a history of a clinically recognized case or injections to immunize artificially. No data on Dick tests are available on the group considered in this study.

Table 1 shows for each sex separately data of the kind considered above for both sexes. No significant differences between the sexes appear.

The numbers of persons who reported that they had received the injections for immunization against scarlet fever are too few to indicate much about their distribution with respect to geographic section or size of city. The available data show no significant differences between urban and rural places included in the study. Regarding geographic region, the indications are that the immunizing procedure has been used less in the South than elsewhere; the North Central region reported slightly more injections than the other sections.<sup>7</sup>

<sup>6</sup> Of the persons 25-44 years of age, 1.4 percent reported that they had received injections for immunizing against scarlet fever; this figure is about one-third of the maximum of 4.1 percent for 10- and 11-year-old children. In the case of diphtheria, 3.2 percent of 25- to 44-year-old persons had been immunized against the disease, but this is only one-thirteenth of the maximum of 43.1 percent for 9-year-old children. The procedure for immunizing against scarlet fever appears to be used relatively more in the adult ages than the older diphtheria immunization procedure.

<sup>7</sup> Comparison of the percentages of children of specific ages who reported a history of a clinical attack of scarlet fever prior to the study indicates no definite variation in different geographic areas except (a) lower percentages for the ages 15-24 in the South and thus, relative to these ages, a higher percentage for the ages under 5 years, and (b) in the North Central region the percentages of children with a history of attack were slightly higher than in the other regions, particularly for the ages 5-14 years.

During the 12-month period of the study scarlet fever in the canvassed families was also low in the South and highest in the North Central section. The case rates per 1,000 children under 15 years of age were: South, 8.8 (30 cases); Northeast, 11.7 (42 cases); West, 13.6 (36 cases); and North Central, 16.2 (100 cases).

Mortality in the general population for the 6 years 1927-32 was somewhat higher in the North Central than in other regions; the higher rate existed in rural, urban, and metropolitan areas considered separately. The rate for white persons in the South was not quite as low as the rate for the West.

Considering death rates for individual States for the same period, 6 of the 12 States in the North Central section and 5 States in the northern part of the Rocky Mountain region (from Colorado north) had rates above 25 per million. Of the rates for white persons in the 16 States of the South (District of Columbia included but Texas excluded) the only State with a rate above 25 per million was in the northern tier of the



### III. CLINICAL CASES AND INJECTIONS FOR IMMUNIZATION DURING THE 12-MONTH STUDY

#### INJECTIONS FOR IMMUNIZING AGAINST SCARLET FEVER

In the observed group, which included 38,544 person-years of life, 28 series of injections were reported, or a rate of 0.73 per 1,000, for the year. Of the total, 26 were done on persons under 15 years of age and amounted to a rate of 1.65 per 1,000 population of these ages. The rates in the three 5-year age groups were similar, 1.63 for under 5 years, 1.75 at 5-9, and 1.53 per 1,000 at 10-14 years. The rate for girls under 15 years was 1.91, slightly higher than for boys, which was 1.39 per 1,000.

Only 36 percent of the 28 series of injections were done in public clinics, as compared with 57 percent of diphtheria immunizations, 52 percent of typhoid immunizations, and 42 percent of smallpox vaccinations. Among families with annual incomes of less than \$3,000, the rate of injections for immunization against scarlet fever was 1.1 per 1,000 children under 15 years, as compared with 2.9 among families with incomes of \$3,000 or above, and 5.0 per 1,000 for those families in the latter group with incomes of \$5,000 or above. While the numbers are small, these data suggest that scarlet fever injections for immunization are largely confined to the higher income brackets.

group (Kentucky); and of the Northeastern States only 2 (Massachusetts and New Hampshire) had rates as high as 25 per million. The following table shows rates by sections:

Geographic section	Average annual death rate per million, 1927-32				
	Total	All urban (10,000 or over)	Rural (under 10,000 and rural areas)	Cities 10,000 to 100,000	Cities of 100,000 or over
All sections.....	21.0	22.5	19.6	21.4	23.1
Northeast.....	20.7	20.6	21.0	19.5	21.2
North Central.....	28.0	29.9	26.2	26.8	31.6
West.....	17.0	13.4	20.1	18.6	11.0
South.....	14.3	17.0	13.5	17.1	17.0
White.....	18.3	21.1	17.4	22.5	19.9
Colored.....	3.6	5.6	2.9	3.1	7.9

The four sections used are combinations of the nine United States census regions as follows: Northeast=New England and Middle Atlantic; North Central=East and West North Central; South=South Atlantic and East and West South Central; West=Mountain and Pacific.

For the years prior to 1930 the urban (10,000 or over in population) classification is made on the basis of the 1920 census; for the years 1930 and later the classification is made on the basis of the 1930 census. The cities of 100,000 and over include for all years all cities that were 100,000 or over in 1930.

Considering urban and rural differences, the relationship varies in different sections; in two regions the urban rates are higher, in one the rural rate is higher, and in one there is little difference between urban and rural. The error due to nonresident deaths is probably negligible.

No significant differences appear between urban and rural areas in the history of clinical cases prior to the study as obtained by the family canvasses. For the 12-month period of the study the scarlet fever case rate per 1,000 children under 15 years of age was 9.2 (56 cases) in rural areas and towns under 5,000, as compared with 15.7 (152 cases) in places of 5,000 or more population (mostly large cities).

Neither histories of cases nor records of immunizing injections prior to the study were particularly different in households that were attacked from those that were not attacked by the disease during the study year. Of 452 children under 15 years of age in attacked households, 9, or 2.0 percent, had been previously immunized, and 20 children, or 4.4 percent, had been previously attacked. These figures may be compared with 2.8 percent immunized and 6.9 percent previously attacked for children under 15 years of age in all canvassed households.

The presence of a case in the family during the study year seems to have stimulated injections for immunizing other children in the household. Of the 244 children under 15 years of age in attacked households who were themselves not attacked during the study year, 4 children, or 1.6 percent, were immunized during the year, as compared with 0.16 percent among children of these ages in the whole surveyed group.

#### SCARLET FEVER CASES IN THE OBSERVED POPULATION

*Incidence in the total surveyed population.*—Of the 230 cases<sup>8</sup> of scarlet fever in the surveyed population, 218 had their onset within the study year and 12 cases began just prior to but were sick during the year. The 218 new cases give an annual rate of 566 per 100,000, but adjustment to the age distribution of the general population brings it down to 420. This rate may be compared with an average annual rate of 173 per 100,000 in 1929–30 as based on cases reported to health departments in the 18 States sampled in the survey. Thus the reported rate was only 41 percent of the rate found by the canvass. The discrepancy is so large that it suggests that the rate in the canvassed group was exceptionally high, presumably because of epidemics in an unusually large number of the surveyed localities. The difference is probably not all due to incompleteness of reporting; various check-ups suggest that roughly two-thirds of recognized scarlet fever cases are reported to health departments.<sup>9</sup>

Of the total of 230 cases of scarlet fever in the surveyed group, 208 occurred in children under 15 years of age. Of these cases, 203, or 14.2 per 1,000, occurred among 14,298 children (years of life) who had never been immunized or attacked; 3, or 2.8 per 1,000, occurred among

<sup>8</sup> Of the 230 scarlet fever cases, 218, or 95 percent, were attended by a physician; 26 of these cases, or 11 percent of all cases, were hospitalized. Two of the other cases had a nurse, but 10 had no professional attendant.

Of the 218 cases attended by a doctor either in or outside a hospital, 168, or 77 percent, of the diagnoses were confirmed by the doctor as correct; in the other 50 attended cases the doctor's diagnosis was not available. Of the 10 unattended cases, 6 were seen by a local health officer and presumably may be considered as confirmed diagnoses. Other surveys have indicated that in the acute communicable diseases the informant's report is nearly always confirmed by the doctor as the correct diagnosis.

<sup>9</sup> A canvass by the State health authorities of over 27,000 families, including nearly 120,000 individuals, in various counties in Illinois and a checkup with the files of reported cases (14, p. 28) indicated that 62 percent of 937 scarlet fever cases that occurred in that group during 1929 were reported to the health department. A similar canvass and checkup on 11,377 households including 58,834 persons in 68 southeastern counties having full-time health officers showed that 72 percent of 437 cases of scarlet fever that occurred had been reported to the health authorities (22).

1,054 children who were reported as having been previously attacked; and 2, or 4.7 per 1,000, among 425 children under 15 years who reported a history of injections for scarlet fever immunization.<sup>10</sup> The number of children in the latter group is too small to have any statistical significance.

*Rates based on attacked households.*—Of the 8,758 surveyed households, 171 were attacked by scarlet fever during the study year; 134 households had 1 case, 24 had 2 cases, 8 had 3 cases, and 5 households had 4 or more cases.

Of the 230 cases of scarlet fever, 186 were primary or first cases in the household and 44 were secondary cases, that is, attacks among those who were exposed to a case in the household.<sup>11</sup> When the 186 primary cases are deducted from the 862 persons in attacked households, there are 676 persons exposed to these cases and 44 of them, or 6.5 percent, were attacked. (See table 2.)

TABLE 2.—Scarlet fever attack rates among persons exposed to a case in the household and the annual incidence in the whole observed population—8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31

Age in years	All persons observed					Persons with no history of a prior case						
	Annual case rate per 100	Persons in attacked households <sup>1</sup>				Annual case rate per 100	Persons in attacked households <sup>1</sup>					
		Total persons	Primary <sup>2</sup> cases	Total persons minus primary cases	Secondary <sup>2</sup> cases		Secondary attack rate per 100	Total persons	Primary <sup>2</sup> cases	Total persons minus primary cases	Secondary <sup>2</sup> cases	Secondary attack rate per 100
All ages <sup>3</sup> .....	0.60	<sup>3</sup> 862	186	<sup>3</sup> 676	44	6.5	0.65	<sup>3</sup> 805	184	<sup>3</sup> 621	43	6.9
All ages under 15.....	1.32	452	171	281	37	13.2	1.39	431	169	262	36	13.7
Under 2.....	.62	56	12	44	2	4.5	.62	56	12	44	2	4.5
2-3.....	.76	47	13	34	3	8.8	.77	47	13	34	3	8.8
4-5.....	1.77	68	32	36	9	25.0	1.82	66	31	35	9	25.7
6-7.....	2.40	91	49	42	7	16.7	2.58	89	49	40	7	17.5
8-9.....	1.39	59	23	36	7	19.4	1.49	57	23	34	7	20.6
Under 5.....	.96	137	43	94	10	10.6	.98	136	43	93	10	10.8
5-9.....	1.82	184	86	98	18	18.4	1.94	179	85	94	18	19.1
10-14.....	1.12	131	42	89	9	10.1	1.22	116	41	75	8	10.7
15-34.....	.15	193	13	180	3	1.7	.17	168	13	155	3	1.9
35 and over.....	.05	215	2	213	4	1.9	.06	205	2	203	4	2.0

<sup>1</sup> Includes births during study year if born before case occurred in household.

<sup>2</sup> Two cases in a household with onset on the same day are both counted primary; secondary includes all with a date of onset subsequent to the first case. According to these definitions, 10 of the 24 households that had 2 cases reported both as primary (onset on same date), and 1 of the 5 households that had 4 or more cases reported all of its 6 cases as primary (onset on same date). The other 26 households with 2 or more cases reported only 1 primary. The ages of the pairs of primary cases in the 10 households were 2, 6; 4, 6; 5, 6; 7, 8; 7, 9; 7, 9; 13, 14; 10, 12; 13, 50; and the ages of the 6 primary cases in one household were 3, 4, 6, 8, 9, 11. None of the above cases had a history of a prior attack or of injections for immunization.

Of the 10 households with 2 primary cases, 3 had 1 other secondary case, 1 had 2 other secondary cases, and 1 had 3 other secondary cases.

Of the 171 attacked households, 134 had 1 case, 24 had 2 cases, 8 had 3 cases, and 5 had 4 or more cases.

<sup>3</sup> "All ages" includes a few of unknown age.

<sup>10</sup> Adjustment for age does not materially change these rates.

<sup>11</sup> See note to table 2 for further details about the classification of cases as primary and secondary in this study.

Considering in a similar way those persons under 15 years of age who were exposed to a case in the household, 13.2 percent were attacked. When the group is limited to children without a prior attack, 13.7 percent of those exposed were attacked. Of the children under 15 who were without prior attack or prior injections for immunization, 14.1 percent of those exposed to a case in the household were attacked. A further restriction of the exposed population to those with a positive Dick test would presumably increase still more the secondary attack rate but no data on skin tests are available for the groups surveyed in this study.

Secondary attack rates are shown in table 2 for persons of specific ages. The highest rates occur from 4 to 10 years, with the maximum at 4-5 years, in agreement with the findings of Pope (31) for Providence (1904-23), and Green (30) for Cleveland (1925-28). The rates are somewhat less than in the Providence data but about the same as in Cleveland.<sup>12</sup>

While the secondary attack rates shown in table 2 do not seem high, they are approximately ten times the annual case rates in the whole canvassed population as shown in the same table; in other words, the risk of attack among children in the same household with a case is at least ten times the annual risk of attack among children of similar ages in the general population.<sup>13</sup>

#### AGE AND SEX INCIDENCE AS REPORTED TO HEALTH DEPARTMENTS

The age and sex incidence of scarlet fever in the surveyed population is shown in table 3. The 230 cases give a general picture of the age incidence of the disease, but one must turn to State Health Department reports for more extensive data. Table 4 and figure 2 show the age incidence of scarlet fever (single years to 10) in Alabama, Connecticut, and New York State (exclusive of New York City, Buffalo, and Rochester). The reported rates are about the same in the two northern States but are smaller in Alabama; the rates are

<sup>12</sup> There are some variations in tabulating and computing procedures in the different studies. When two or more cases in a family had the same date of onset, and there were no earlier cases, the Providence reports use only one as a primary case and the others as secondary. This procedure appears to have been used in Cleveland also. If the data of the present study are tabulated on the basis of counting only one primary case for an attacked household, the secondary attack rate for children under 15 years of age with no prior attack is 18.1 per 100, which is about the same as in Providence but larger than in Cleveland. (As all except one of the cases involved were under 15 years of age, it makes little difference which is selected as "primary" and which is considered as "secondary," so long as one works only with the total under 15 years). Pope (31) states that the secondary attack rate varies widely from year to year in Providence; therefore, close agreement would not necessarily be expected.

The Providence data are based on families in which the patient remained at home throughout the illness and did not die; adjustment of the data of the present study to that basis makes no consistent differences in the secondary attack rates.

<sup>13</sup> Since the period of exposure to cases in a given household would not average more than 2 months, the secondary attack rate might be multiplied by six to put it on an annual basis comparable to the annual incidence rate in the whole population. Thus the risk of attack during exposure to a case in a household might be as much as 60 times the risk in the general population.

TABLE 3.—*Annual incidence of scarlet fever among males and females of specific ages—canvassed white families in 18 States during 12 consecutive months, 1928-31*

Age in years	Annual case rate per 1,000			Number of cases			Population (years of life)		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
All ages <sup>1</sup> .....	6.0	6.5	5.5	230	122	108	138,544	118,896	19,627
All ages under 15.....	13.2	14.5	11.9	208	115	93	15,796	7,929	7,816
Under 2.....	6.2	7.1	5.5	14	8	6	2,251	1,133	1,097
2-3.....	7.6	8.2	6.8	16	9	7	2,116	1,093	1,023
4-5.....	17.7	19.3	16.1	41	22	19	2,318	1,140	1,178
6-7.....	24.0	22.0	26.2	56	26	30	2,329	1,184	1,145
8-9.....	13.6	15.8	11.4	30	17	13	2,214	1,078	1,136
Under 5.....	9.6	11.4	7.8	53	32	21	5,513	2,808	2,684
5-9.....	18.2	17.7	18.7	104	50	54	5,715	2,820	2,895
10-14.....	11.2	14.3	7.9	51	33	18	4,568	2,301	2,267
15-19.....	2.3	2.6	2.0	7	4	3	3,050	1,527	1,523
20-34.....	1.2	.3	1.8	9	1	8	7,759	3,296	4,463
35-49.....	.5			4			7,858		
50 and over.....	.5	.3	.7	2	2	4	3,894	6,065	5,687

<sup>1</sup> "All ages" includes a few of unknown age; "both sexes" includes a few of unknown sex.

TABLE 4.—*Age incidence of scarlet fever in Alabama, New York,<sup>1</sup> and Connecticut—based on cases reported to health departments,<sup>2</sup> 1927-32*

Age in years	Annual case rate per 100,000					Number of cases reported in the 6 years				
	Alabama (white)			Both sexes		Alabama (white)			Both sexes	
	Both sexes	Male	Female	New York	Connecticut	Both sexes	Male	Female	New York <sup>1</sup>	Connecticut
All ages <sup>3</sup> .....	76.4	61.9	91.2	205.6	173.3	<sup>3</sup> 7,797	<sup>3</sup> 3,184	<sup>3</sup> 4,613	58,672	<sup>3</sup> 16,711
All ages under 15.....	193.4	156.2	232.0	633.8	507.7	7,129	2,929	4,200	46,911	13,570
Under 1.....	58.8	61.4	56.2	76.9	50.5	143	76	67	331	75
1.....	119.5	112.3	126.9	187.3	54.2	283	136	147	818	82
2.....	215.0	209.5	226.8	431.7	370.0	538	267	271	2,033	603
3.....	259.5	214.9	305.4	635.8	563.3	674	283	391	3,057	939
4.....	347.3	299.5	396.8	776.2	648.5	854	375	479	3,714	1,089
5.....	286.3	225.5	348.9	950.9	805.6	739	295	444	4,810	1,434
6.....	358.7	282.6	437.7	1,136.5	986.0	925	371	554	5,722	1,757
7.....	321.2	253.0	391.7	1,033.2	876.3	799	320	479	5,270	1,573
8.....	242.5	174.0	313.2	877.1	757.4	644	235	409	4,645	1,446
9.....	173.4	123.4	225.2	767.2	584.5	439	159	280	4,016	1,102
Under 5.....	201.7	180.7	223.4	433.3	349.6	2,492	1,137	1,355	9,953	2,788
5-9.....	276.3	211.5	343.2	951.0	799.0	3,546	1,380	2,166	24,463	7,312
10-14.....	93.5	69.4	118.5	493.5	361.3	1,091	412	679	12,495	3,470
15-19.....	22.4	18.2	26.5	181.7	119.6	248	101	147	4,297	1,063
20-24.....	11.2	5.7	16.3	107.3	71.4	109	27	82	2,496	565
25-34.....	6.5	3.4	9.5	71.2	42.3	94	24	70	3,027	614
35-44.....	2.4	2.1	2.6	34.4		27	12	15	1,469	
45-54.....	.9	.8	.9	12.5	<sup>4</sup> 17.4	8	4	4	426	<sup>4</sup> 357
55 and over.....	.3	.4	.2	3.0	<sup>4</sup> 4.0	3	2	1	136	<sup>4</sup> 71

<sup>1</sup> Exclusive of New York City, Buffalo and Rochester, and exclusive of cases and deaths in State institutions.

<sup>2</sup> Data from annual reports of the respective State health departments (11, 15, 18).

<sup>3</sup> "All ages" includes some of unknown age.

<sup>4</sup> 35-49.

<sup>5</sup> 50 and over.



plotted on scales that afford an accurate comparison of the relative age curves. In New York and Connecticut there is a single peak at 6 years of age, but the Alabama curve has two peaks of almost equal size, at 4 and 6 years, respectively. The rates for Mississippi (table 5) are, like those for Alabama, relatively high for the ages under 5 years, but the rates for California and Michigan are more like those for New York.

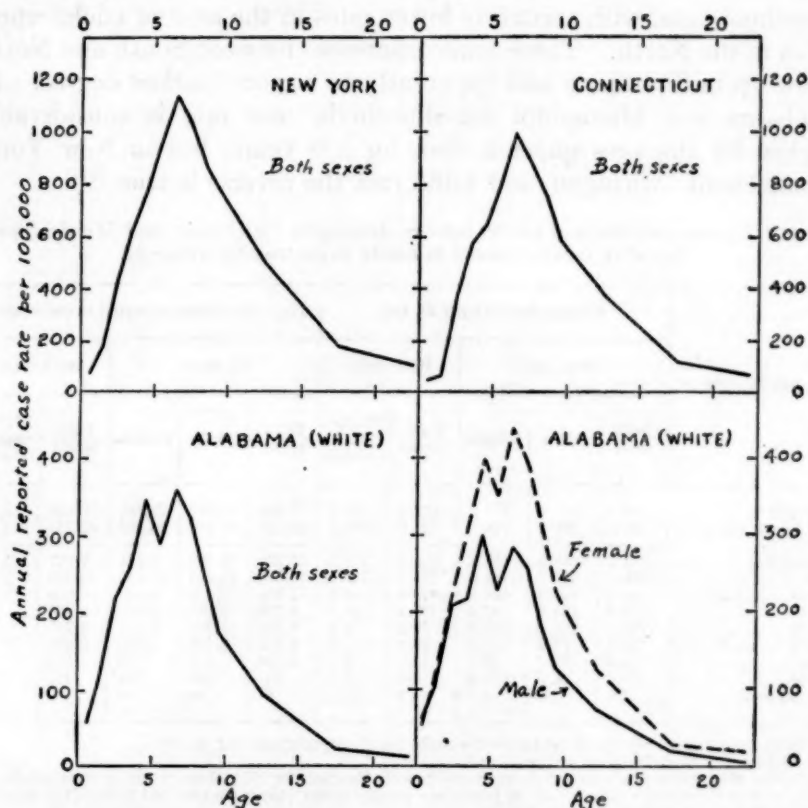


FIGURE 2.—Age and sex incidence (in single years to 10) of scarlet fever as reported to health departments in Alabama, Connecticut, and New York (exclusive of New York City, Buffalo, and Rochester), 1927-32. (Scales are so made that the rate for all ages under 15 years represents an interval on the vertical scale that corresponds to approximately 10 years on the horizontal scale.)

In Alabama and Mississippi during the 6 years 1927-32 the case rates under 5 years are 73 and 67 percent, respectively, of the rates at 5-9 years, but the corresponding percentages in the northern States are New York 45, Connecticut 44, Michigan 52, and California 40 percent. Thus among white persons in the two southern States the rates under 5 years are relatively higher than in the North.

Along with this relatively high rate for children under 5 years in the South goes a relatively low rate among older children. In Alabama and Mississippi the case rate under 5 years is 9.0 and 6.6 times,

respectively, that at 15-19 years, as compared with 2.4 for New York, 2.9 for Connecticut, 3.3 for Michigan, and 2.5 for California. Corresponding ratios for death rates under 5 years to those at 15-19 years are 47.7 and 18.5 for Alabama and Mississippi, respectively, as compared with 5.0 for New York, 11.2 for Connecticut, 8.1 for Michigan, and 5.3 for California.<sup>14</sup>

Thus in the South there is a greater concentration of cases in the preschool ages, with relatively lower rates in the ages of adolescence, than in the North. These same differences between South and North show up in diphtheria and apparently to a more marked degree. In Alabama and Mississippi the diphtheria case rate is considerably higher for the ages under 5 than for 5-9 years; but in New York, Connecticut, Michigan, and California the reverse is true (9).

TABLE 5.—*Age incidence of scarlet fever in Michigan, California, and Mississippi—based on cases reported to health departments, 1927-32*

Age in years	Annual case rate per 100,000					Number of cases reported in the 6 years				
	Michigan			Both sexes		Michigan			Both sexes	
	Both sexes	Male	Female	California	Mississippi (white)	Both sexes	Male	Female	California	Mississippi (white) <sup>1</sup>
All ages <sup>2</sup> .....	258.8	241.2	277.9	147.7	90.9	75,194	36,462	38,732	50,325	5,434
All ages under 15.....	715.2	702.1	728.7	524.9	236.9	60,331	30,028	30,303	40,785	4,960
Under 5.....	570.7	585.2	555.7	321.8	233.3	15,870	8,289	7,581	7,827	1,630
5-9.....	1,088.8	1,050.7	1,128.0	798.2	350.5	31,813	15,561	16,252	22,289	2,560
10-14.....	462.8	447.9	478.0	419.3	115.4	12,048	6,178	6,470	10,669	770
15-19.....	173.4	164.3	182.6	128.4	35.1	4,338	2,062	2,276	3,303	226
20-24.....	131.8	105.6	158.8	59.9	24.3	3,306	1,345	1,961	1,707	138
25-34.....	88.8	68.9	110.8	39.8	10.2	4,302	1,756	2,546	2,338	86
35-44.....	32.8	25.0	42.1	15.7	2.6	1,436	596	840	879	18
45-54.....	11.6	8.9	14.8	4.5	1.1	347	144	203	195	6
55 and over.....	2.6	2.5	2.7	1.4	-----	87	43	44	69	0

<sup>1</sup> Data from annual reports of the respective State health departments (12, 16, 17).

<sup>2</sup> "All ages" includes some of unknown age.

<sup>3</sup> In the Mississippi State Health Department reports the cases for 1927-28 are given by color for all ages only; to take the colored cases out of the totals for each age group, they were assumed to have the same age distribution as the colored cases for 1929-32.

The age groups used in the 1927-28 report were broader than in the 1929-32 reports; to combine the 1927-28 and 1929-32 cases it was assumed that the cases 10-19 years of age in 1927-28 were distributed between 10-14 and 15-19 as in 1929-32; it was also assumed that the age distribution of cases for the ages 20 years and over was the same in 1927-28 as in 1929-32.

The differences between the age distribution of scarlet fever in the South and North may be illustrated in another way. In Alabama and Mississippi, 33 and 30 percent, respectively, of the reported cases in 1927-32 were in children under 5 years of age, but in New York (exclusive of New York City, Buffalo, and Rochester) and also Connecticut, only 17 percent of the cases were in that age group. In Michigan 21 percent and in California 16 percent of the cases were in

<sup>14</sup> If ratios of the case and death rates at 5-9 to those at 15-19 years are computed in a similar way, the two southern States also stand out as having, relative to the rate at 5-9 years, a lower case and a lower death rate at 15-19 years than in any of the four northern States.

children under 5 years. Turning to mortality for the same period, 66 and 55 percent of the scarlet fever deaths in Alabama and Mississippi, respectively, were under 5 years of age, as compared with 31 percent in New York, 35 percent in Connecticut, 44 percent in Michigan, and 29 percent in California. While there are more young children in the South, the differences in the age distribution of scarlet fever are greater than would be accounted for by the age distribution of the population. Doull (26) has discussed differences in the age incidence of scarlet fever in relation to latitude.<sup>15</sup>

Figure 2 shows also scarlet fever age incidence (single years to 10) by sex for Alabama. The concentration of cases in the early ages is somewhat greater for males than females. In males the peak at 4 years is slightly higher than that at 6, but in females the 6-year peak is more important. The reported rates for females are definitely and consistently higher than for males at all ages except those under 3 years (table 4).

Data for Michigan are available by sex in 5-year age groups (table 5); the rates for females are higher than for males at all ages except under 5 years. The percentage excess is particularly large in the adult ages, presumably because of the close contact between the mother and her children when they have the disease.

#### MORTALITY AND CASE FATALITY

In the continental United States 356,855 cases (white and colored) of scarlet fever were reported in the 2 years 1929-30, an average annual incidence of 145 per 100,000. A total of 4,858 deaths registered<sup>16</sup> gives an annual mortality rate of 1.98 per 100,000 and a case fatality of 1.36 percent, a figure that is no doubt too high because of the incompleteness of case reporting. To express it in another way, there were 73 cases reported for each death registered. In a group of 81 cities (19) with populations over 100,000, where reporting is probably better but still incomplete, the average annual case rate for

<sup>15</sup> The 1925 report for New York (18) gives for the years 1915-24 scarlet fever cases and deaths by age and size of city, with cities under 2,500 and rural as one of the categories; 16.1 percent of the reported cases in these rural areas were under 5 years of age as compared with 18.7 for places from 20,000 to 200,000, the most urban group shown. Scarlet fever deaths showed more variation; in communities of less than 2,500 and rural areas, 34 percent of the deaths were of children under 5 years of age, as compared with 39 percent in cities of 20,000 to 200,000 population. These percentages for the years 1915-24 are higher than those for 1927-32 that are cited above.

The geographic differences in the age distribution of scarlet fever are considerably greater than the urban-rural differences in these data for New York State.

For the 12-month period of the study, scarlet fever case rates among the canvassed families were computed in 5-year age groups for (a) towns under 5,000 and rural areas, and (b) towns and cities over 5,000, consisting mainly of large cities. In the rural group the rate under 5 years was only about half of that at 10-14 years; in the cities the rate under 5 was about the same as at 10-14 years. The numbers of cases were small but the tendencies are the same as in the New York State data and as found by Fales (27) in a study of data from various States; that is, there is a relatively younger age distribution of cases in urban than in rural areas.

<sup>16</sup> Mortality Statistics (10) supplemented by State reports (19) for South Dakota in 1929 and Texas in 1929 and 1930.

1929-30 was 181 per 100,000, and the death rate 2.06 per 100,000, with a case fatality of 1.14 percent, or 88 cases reported for each death registered. Wood (34), in studies in Pennsylvania (1930-31), found a case fatality of 0.85 percent, or 117 cases for each death occurring in the families investigated. In the 6 years 1927-32 the case fatality as based on reported cases in California and Connecticut was 0.80 and 0.68 percent, respectively. The wide differences between the various States are largely artificial, resulting from the incompleteness with which the cases are reported. The true fatality of scarlet fever about 1930 was probably somewhat less than 1 death per 100 cases.<sup>17</sup>

Table 6 and figure 3 show scarlet fever mortality by age and sex in the white population of the registration States. The peak of mortality comes at 3 years of age, which is 1 to 3 years earlier than the maximum case incidence. After the peak, the decline is rapid, but there is a considerable number of deaths among adults; 21 percent of the scarlet fever deaths were in persons aged 15 years or over, as compared with 8 percent of diphtheria deaths for the same area and period.

TABLE 6.—Annual scarlet fever mortality at specific ages for each sex—white persons in the registration States,<sup>1</sup> 1929-30

Age in years	Annual death rate per million			Number of deaths (2 years)		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages <sup>2</sup> .....	21.9	21.7	22.1	<sup>2</sup> 4,570	<sup>2</sup> 2,293	<sup>2</sup> 2,277
All ages under 15.....	60.1	62.4	57.7	3,604	1,899	1,705
Under 1.....	60.0	66.3	53.6	217	122	95
1.....	114.5	125.4	103.1	412	230	182
2.....	118.3	126.1	110.3	456	247	209
3.....	123.8	130.8	116.7	489	262	227
4.....	103.1	107.7	98.3	404	215	189
Under 5.....	104.5	111.7	97.0	1,978	1,076	902
5-9.....	58.8	60.1	57.5	1,229	637	592
10-14.....	19.7	18.2	21.2	397	186	211
15-19.....	12.2	11.0	13.4	235	106	129
20-24.....	11.1	8.0	14.1	200	71	129
25-34.....	9.0	7.6	10.5	288	120	168
35-44.....	4.5	3.7	5.4	133	56	77
45-54.....	2.9	2.1	3.7	65	25	40
55-64.....	2.0	1.3	2.8	30	10	20
65 and over.....	1.1	.8	1.3	13	5	8

<sup>1</sup> Registration States included all except Texas and South Dakota in 1929 and all except Texas in 1930.

<sup>2</sup> "All ages" includes a few of unknown age.

<sup>17</sup> Among the 230 scarlet fever cases in the canvassed population of the present study there were 6 deaths, or a case fatality of 2.6 percent. The 6 deaths were distributed as follows: Two deaths among 17 cases in Illinois (Chicago); 3 deaths among 26 cases in Wisconsin; and 1 death among 10 cases in Washington State. If the data from the present study are combined with preceding surveys of a similar nature, there is a total of 7 deaths among 432 cases, or a case fatality of 1.6 percent. (The various surveys include: Hagerstown, Md., 1921-24, 34 cases, no deaths; Syracuse, N. Y., 1930-31, 46 cases, no deaths; Cattaraugus County, N. Y., 1929-32, 84 cases, 1 death; families canvassed for less than a full year in the present study, 38 cases, no deaths; families canvassed for the full year in the present study, 230 cases, 6 deaths.)

Among children under 10 years, scarlet fever mortality rates are somewhat higher for males than females but above that age the reverse is true.

Tables 7 and 8 show case fatality for persons of specific ages in six States. The variation from State to State is largely artificial, since it results mainly from the incompleteness of reporting of cases. The purpose of the table is to show the relative case fatality at different ages rather than to compare States. In figure 4 these rates are plotted (single years to five) for Alabama and New York State. Unlike the other children's diseases, the percentage of cases that end fatally is not much higher among infants under 1 year of age

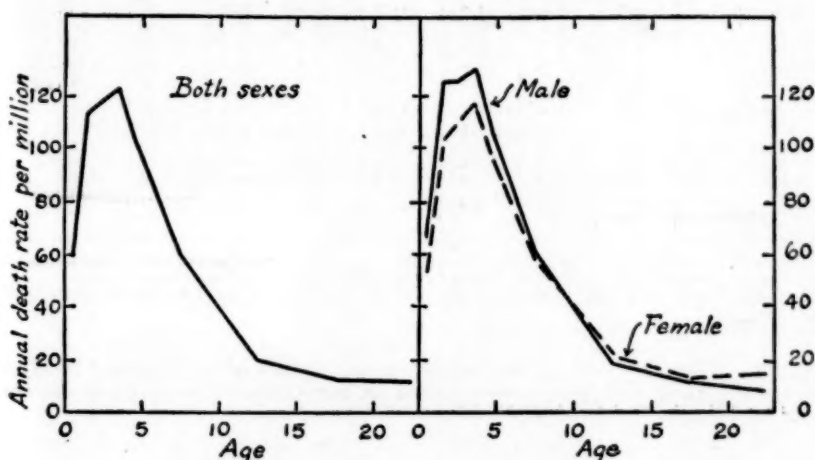


FIGURE 3.—Scarlet fever mortality at specific ages (single years to 5) for each sex—white population in the registration States, 1929-30. (Scales are so made that the rate for all ages under 15 years represents an interval on the vertical scale that corresponds to approximately 10 years on the horizontal scale.)

than among 1-year-old children. In Alabama there is no difference between the two ages. Studies of scarlet fever in Providence (31) and elsewhere (25) confirm this finding. After 1 year the fatality drops precipitously (fig. 4) to a low level for the ages above 3 or 4 years, but there is apparently some increase in the middle and older ages of life (tables 7 and 8). Relative to the fatality of cases over 5 years of age, that of children under 5 tends to be slightly greater in the South than in the North. In Alabama and Mississippi, respectively, the case fatality in children under 5 years is 4.0 and 2.9 times that for children 5 years old and over; these ratios may be compared with corresponding ratios of 2.2 for New York, 2.6 for Connecticut, 2.8 for Michigan, and 2.2 for California.



TABLE 7.—*Variation with age and sex in the case fatality of scarlet fever*<sup>1</sup> *in Alabama, New York, and Connecticut—based on cases reported to health departments and total deaths registered, 1927-32*

Age in years	Deaths per 100 reported cases			Annual death rate per million population			Number of deaths in the 6 years		
	Ala-bama (white)	New York <sup>2</sup>	Connec-ticut	Ala-bama (white)	New York <sup>2</sup>	Connec-ticut	Ala-bama (white)	New York <sup>2</sup>	Connec-ticut
All ages:									
Both sexes.....	2.05	0.89	0.68	15.7	18.3	11.8	160	523	114
Male.....	2.61	( <sup>3</sup> )	( <sup>3</sup> )	16.1	18.9	12.7	83	271	61
Female.....	1.67			15.2	17.8	11.0	77	252	53
Both sexes:									
All ages under 15.....	2.15	.78	.63	41.5	49.6	32.2	153	367	86
Under 1.....	10.5	4.8	4.0	61.7	37.2	20.2	15	16	3
1.....	10.6	4.4	8.5	126.6	82.5	46.3	30	36	7
2.....	4.3	2.0	1.3	91.9	87.1	49.1	23	41	8
3.....	2.2	1.4	1.1	57.8	89.4	60.0	15	43	10
4.....	2.7	.7	1.1	93.5	54.3	71.5	23	26	12
Under 5.....	4.3	1.6	1.4	85.8	70.5	50.2	106	162	40
5-9.....	1.1	.6	.4	29.6	58.7	22.8	38	151	30
10-14.....	.8	.4	.5	7.7	21.3	16.7	9	54	16
15-19.....	.8	.8	.4	1.8	14.0	4.5	2	33	4
20-34.....	2.5	1.2	.9	2.1	10.2	4.5	5	66	10
35-54.....		2.5			6.1	3.9		47	10
55 and over.....		7.3	3.3		2.2	3.1		10	4

<sup>1</sup> Cases from the annual reports of the respective State health departments (see table 4); deaths from Mortality Statistics for the United States (10), except that New York deaths are from State reports.

<sup>2</sup> Exclusive of New York City, Buffalo, and Rochester, and exclusive of cases and deaths in State institutions.

<sup>3</sup> Cases not available by sex.

TABLE 8.—*Variation with age and sex in the case fatality of scarlet fever*<sup>1</sup> *in Michigan, California, and Mississippi—based on cases reported to health departments and total deaths registered, 1927-32*

Age in years	Deaths per 100 reported cases			Annual death rate per million population			Number of deaths in the 6 years		
	Michi-gan	Calif-ornia	Missis-sippi (white)	Michi-gan	Calif-ornia	Missis-sippi (white)	Michi-gan	Calif-ornia	Missis-sippi (white)
All ages:									
Both sexes.....	1.18	0.80	1.34	30.6	11.9	12.2	890	404	73
Male.....	1.22	( <sup>3</sup> )	( <sup>3</sup> )	29.5	10.9	9.6	446	193	29
Female.....	1.15			31.9	12.9	14.9	444	211	44
Both sexes:									
All ages under 15.....	1.16	.70	1.35	82.7	36.8	32.0	698	286	67
Under 5.....	2.4	1.5	2.5	139.6	48.9	57.3	388	119	40
5-9.....	.7	.6	.9	78.0	44.4	30.1	228	124	22
10-14.....	.6	.4	.6	30.0	16.9	7.5	82	43	5
15-19.....	1.0	.7	.9	17.2	9.3	3.1	43	24	2
20-34.....	1.1	1.5	1.3	11.7	7.0	2.1	86	61	8
35-54.....	3.0	2.2		7.2	2.4		53	24	
55 and over.....	11.5	13.0		3.0	1.8		10	9	

<sup>1</sup> Cases from the annual reports of the respective State health departments (see table 5); deaths from Mortality Statistics for the United States (10).

<sup>2</sup> "All ages" includes one of unknown age.

<sup>3</sup> Cases not available by sex.

## IV. SUMMARY

Data on the history of clinical cases and of injections for artificial immunization against scarlet fever at any time and more detailed records during a 12-month period between 1928 and 1931 were obtained on 8,758 white families in 130 localities in 18 States. Each family was visited at intervals of 2 to 4 months to secure the information.

The surveyed families include representation from nearly all geographic sections, from rural, urban, and metropolitan areas, from all income classes, and of both native- and foreign-born persons.

Considering the whole group, a maximum of 4 percent of 10- and 11-year-old children gave a history of injections for artificial immunization against scarlet fever. At 15-19 years, 3 percent gave a history

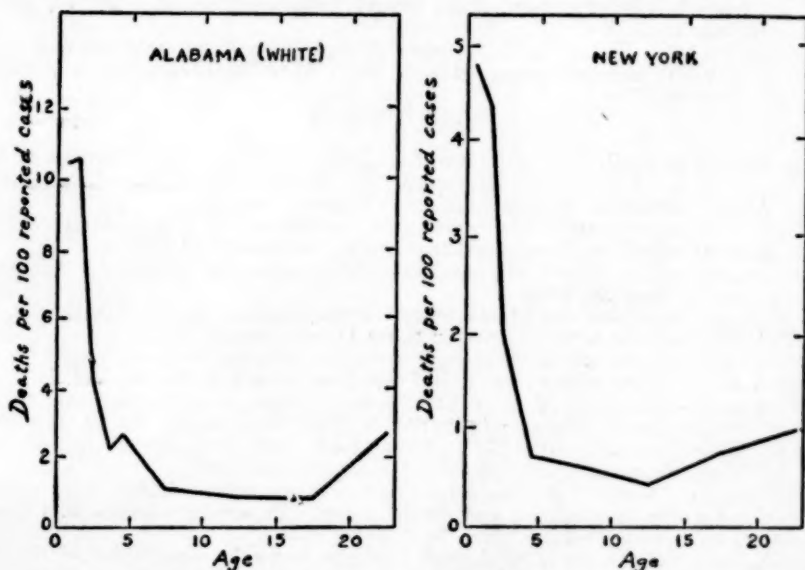


FIGURE 4.—Variation with age (single years to 5) in the case fatality of scarlet fever—deaths per 100 reported cases in Alabama and New York (exclusive of New York City, Buffalo, and Rochester), 1927-32. (Scales are so made that the rate for all ages under 15 years represents an interval on the vertical scale that corresponds to approximately 5 years on the horizontal scale.)

of injections for immunization and 13 percent a history of a clinical attack of scarlet fever (fig. 1).

Boys and girls show about the same percentage with a history of injections for scarlet fever immunization and also with a history of a clinical attack.

Injections for immunization during the 12 months of the morbidity study amounted to 1.65 per 1,000 children under 15 years of age.

Scarlet fever case incidence is relatively higher in the pre-school ages in the South than in the North (fig. 2). The peak of scarlet fever mortality in the registration States occurs at 3 years of age (fig. 3).

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### DEATHS DURING WEEK ENDED FEB. 26, 1938

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Feb. 26, 1938	Correspond- ing week, 1937
<b>Data from 86 large cities of the United States:</b>		
Total deaths.....	8,609	9,954
Average for 3 prior years.....	9,746	-----
Total deaths, first 8 weeks of year.....	71,736	85,530
Deaths under 1 year of age.....	554	646
Average for 3 prior years.....	600	-----
Deaths under 1 year of age, first 8 weeks of year.....	4,301	5,183
<b>Data from industrial insurance companies:</b>		
Policies in force.....	69,772,226	69,272,935
Number of death claims.....	12,091	13,893
Death claims per 1,000 policies in force, annual rate.....	9.0	10.5
Death claims per 1,000 policies, first 8 weeks of year, annual rate.....	10.0	11.5

# PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

## UNITED STATES

### CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers.

In these and the following tables a zero (0) is to be interpreted to mean that no cases or deaths occurred, while leaders (.....) indicate that cases or deaths may have occurred although none were reported.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 5, 1938, and Mar. 6, 1937

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 5, 1938	Week ended Mar. 6, 1937	Week ended Mar. 5, 1938	Week ended Mar. 6, 1937	Week ended Mar. 5, 1938	Week ended Mar. 6, 1937	Week ended Mar. 5, 1938	Week ended Mar. 6, 1937
<b>New England States:</b>								
Maine.....	8		3	111	165	26	0	0
New Hampshire.....					33	9	0	0
Vermont.....	2	2			172	1	0	0
Massachusetts.....	5	3			242	916	3	11
Rhode Island.....	1	1			1	318	0	2
Connecticut.....	8	1	2	21	8	583	1	1
<b>Middle Atlantic States:</b>								
New York.....	31	42	118	156	1,848	593	10	13
New Jersey.....	14	13	29	67	1,437	2,082	3	4
Pennsylvania.....	51	30			7,508	388	3	14
<b>East North Central States:</b>								
Ohio.....	22	24		103	2,170	34	0	9
Indiana.....	38	11	22	89	955	17	2	1
Illinois.....	41	44	14	74	6,933	32	5	7
Michigan <sup>1</sup> .....	33	12	2	2	3,564	73	2	1
Wisconsin.....	13	6	74	120	4,316	21	2	8
<b>West North Central States:</b>								
Minnesota.....	3	3	5	3	63	16	2	2
Iowa.....	5	3	1	27	54	1	1	0
Missouri.....	13	20	146	382	907	11	1	3
North Dakota.....		1	2	31	8	1	0	0
South Dakota.....			2	9		3	1	2
Nebraska.....	17	4	42		23	1	18	2
Kansas.....	11	13	21	55	382	5	2	0
<b>South Atlantic States:</b>								
Delaware.....	3			18	26	73	0	0
Maryland <sup>1</sup> .....	14	9	10	231	66	693	4	6
District of Columbia.....	7	4	1	3	5	75	2	0
Virginia.....	23	16			461	218	5	8
West Virginia.....	12	5	52	592	531	38	2	7
North Carolina <sup>1</sup> .....	31	19	36	217	2,659	88	5	6
South Carolina.....	9	6	481	1,707	610	33	1	0
Georgia <sup>1</sup> .....	3	11		1,176	404		1	2
Florida <sup>1</sup> .....	13	5	1	43	569	2	0	8

See footnotes at end of table.



*Cases of certain communicable diseases reported by telegraph by State health officers  
for weeks ended Mar. 5, 1938, and Mar. 6, 1937—Continued*

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 5, 1938	Week ended Mar. 6, 1937	Week ended Mar. 5, 1938	Week ended Mar. 6, 1937	Week ended Mar. 5, 1938	Week ended Mar. 6, 1937	Week ended Mar. 5, 1938	Week ended Mar. 6, 1937
<b>East South Central States:</b>								
Kentucky.....	13	21	41	508	602	121	6	20
Tennessee.....	7	10	75	381	725	20	6	9
Alabama.....	11	19	195	2,487	1,117	14	3	2
Mississippi <sup>1</sup> .....	8						0	0
<b>West South Central States:</b>								
Arkansas.....	11	2	184	303	310	1	0	0
Louisiana.....	10	14	7	143	7	6	0	2
Oklahoma <sup>1</sup> .....	10	6	222	809	58	34	0	6
Texas <sup>1</sup> .....	47	45	888	3,745	594	538	4	14
<b>Mountain States:</b>								
Montana.....		2		29	49	62	0	1
Idaho.....	1		7	23	3	28	0	0
Wyoming.....					17	2	0	0
Colorado.....	15	8			620	3	0	0
New Mexico.....	3	5	5	95	60	99	0	1
Arizona.....		7	85	177	9	199	0	1
Utah <sup>1</sup> .....	6				281	24	1	0
<b>Pacific States:</b>								
Washington.....	6	8	4	3	8	23	2	1
Oregon.....			68	121	33	5	0	0
California.....	27	20	53	1,173	398	90	5	7
<b>Total.....</b>	<b>606</b>	<b>472</b>	<b>2,798</b>	<b>15,134</b>	<b>41,011</b>	<b>7,620</b>	<b>103</b>	<b>171</b>
<b>First 9 weeks of year.....</b>	<b>5,803</b>	<b>5,056</b>	<b>27,416</b>	<b>224,549</b>	<b>242,887</b>	<b>45,334</b>	<b>858</b>	<b>1,418</b>

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid and paratyphoid fevers		Whooping cough
	Week ended Mar. 5, 1938	Week ended Mar. 6, 1937	Week ended Mar. 5, 1938	Week ended Mar. 6, 1937	Week ended Mar. 5, 1938	Week ended Mar. 6, 1937	Week ended Mar. 5, 1938	Week ended Mar. 6, 1937	Week ended Mar. 5, 1938
<b>New England States:</b>									
Maine.....	0	0	12	27	0	0	1	1	89
New Hampshire.....	0	0	33	27	0	0	0	0	16
Vermont.....	0	0	16	11	0	0	0	1	42
Massachusetts.....	0	1	279	224	0	0	1	1	117
Rhode Island.....	0	0	18	50	0	0	0	1	29
Connecticut.....	0	0	90	97	0	0	0	0	46
<b>Middle Atlantic States:</b>									
New York.....	0	1	905	957	0	1	2	3	472
New Jersey.....	0	1	125	206	0	0	2	2	177
Pennsylvania.....	1	1	608	826	0	0	3	3	285
<b>East North Central States:</b>									
Ohio.....	0	0	293	313	23	3	2	0	116
Indiana.....	1	1	198	246	50	4	1	3	22
Illinois.....	1	1	699	707	31	12	4	2	121
Michigan <sup>1</sup> .....	1	1	620	623	16	1	6	6	177
Wisconsin.....	0	0	170	333	4	9	1	0	141
<b>West North Central States:</b>									
Minnesota.....	1	0	125	183	28	8	1	0	30
Iowa.....	0	2	257	365	24	18	0	0	35
Missouri.....	0	0	233	424	46	89	4	6	39
North Dakota.....	0	1	29	50	9	8	0	0	24
South Dakota.....	0	0	24	79	15	2	0	0	17
Nebraska.....	0	1	67	66	9	5	0	0	19
Kansas.....	0	0	217	336	28	31	0	0	155
<b>South Atlantic States:</b>									
Delaware.....	0	0	16	10	0	0	0	0	6
Maryland.....	0	0	73	31	0	0	2	1	86
District of Columbia.....	0	1	25	13	0	0	0	0	9
Virginia.....	1	1	40	30	0	0	1	2	76
West Virginia.....	1	0	82	45	0	1	4	1	70
North Carolina <sup>1</sup> .....	1	0	58	44	1	0	0	6	417

See footnotes at end of table.

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 5, 1938, and Mar. 6, 1937—Continued*

Division and State	Polliomyelitis		Scarlet fever		Smallpox		Typhoid and paratyphoid fevers		Whooping cough
	Week ended Mar. 5, 1938	Week ended Mar. 6, 1937	Week ended Mar. 5, 1938	Week ended Mar. 6, 1937	Week ended Mar. 5, 1938	Week ended Mar. 6, 1937	Week ended Mar. 5, 1938	Week ended Mar. 6, 1937	Week ended Mar. 5, 1938
South Atlantic States—Con.									
South Carolina.....	0	0	4	7	0	0	0	1	96
Georgia <sup>1</sup> .....	0	0	7	7	7	1	5	1	11
Florida <sup>2</sup> .....	0	2	8	5	0	0	2	1	-----
East South Central States:									
Kentucky.....	0	0	89	58	30	0	2	11	134
Tennessee.....	0	0	37	20	10	0	0	3	64
Alabama.....	1	0	11	15	0	0	0	2	24
Mississippi <sup>1</sup> .....	1	0	9	7	1	0	1	0	-----
West South Central States:									
Arkansas.....	0	0	9	17	6	4	1	1	52
Louisiana.....	0	0	11	3	0	1	21	6	12
Oklahoma <sup>4</sup> .....	1	0	31	40	30	5	3	5	41
Texas <sup>2</sup> .....	3	1	127	113	29	1	7	16	304
Mountain States:									
Montana.....	0	0	31	41	23	22	0	0	28
Idaho.....	1	1	34	16	9	3	0	0	9
Wyoming.....	0	0	37	41	0	6	0	1	19
Colorado.....	0	1	46	73	10	2	1	1	8
New Mexico.....	0	0	30	26	0	1	2	4	36
Arizona.....	1	0	6	12	0	0	0	0	40
Utah <sup>1</sup> .....	0	0	54	13	3	0	0	0	28
Pacific States:									
Washington.....	0	0	51	41	64	8	1	2	124
Oregon.....	0	0	68	25	16	28	0	0	7
California.....	2	3	212	250	12	19	0	6	403
Total.....	18	21	6,224	7,153	534	293	81	100	4,273
First 9 weeks of year.....	192	195	54,300	57,724	5,184	2,657	1,067	985	36,089

<sup>1</sup> New York City only.

<sup>2</sup> Period ended earlier than Saturday.

<sup>3</sup> Typhus fever, week ended Mar. 5, 1938, 22 cases, as follows: North Carolina, 2; Georgia, 6; Florida, 3; Texas, 11.

<sup>4</sup> Figures for 1937 are exclusive of Oklahoma City and Tulsa.

### SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Menin- gococ- cus menin- gitis	Diph- theria	Influa- enza	Mala- ria	Meas- les	Pel- lagra	Polio- mye- litis	Scarlet fever	Small- pox	Ty- phoid fever
<i>January 1938</i>										
Alaska.....	5	0	18	-----	1	-----	0	-----	1	1
California.....	11	145	512	10	653	7	9	967	176	29
Hawaii Territory.....	1	15	49	-----	91	-----	0	-----	0	3
Kansas.....	3	47	69	-----	1,268	2	3	917	80	8
North Dakota.....	0	2	8	-----	26	-----	1	105	64	-----
Washington.....	2	13	20	-----	133	-----	3	331	158	9
Wisconsin.....	-----	12	168	-----	4,613	-----	4	836	30	-----
<i>February 1938</i>										
Arkansas.....	8	49	850	57	1,297	14	2	49	48	15
Connecticut.....	0	17	31	-----	57	-----	0	405	0	1
Delaware.....	0	3	-----	-----	111	-----	0	49	0	0

## Summary of monthly reports from States—Continued

January 1938		January 1938—Continued		January 1938—Continued	
	Cases		Cases		Cases
<b>Anthrax:</b>		<b>Mumps—Continued.</b>		<b>Whooping cough—Contd.</b>	
Hawaii Territory.....	1	North Dakota.....	60	Washington.....	666
<b>Botulism:</b>		Washington.....	867	Wisconsin.....	658
Washington.....	1	Wisconsin.....	836		
<b>Chickenpox:</b>		<b>Ophthalmia neonatorum:</b>		February 1938	
Alaska.....	10	California.....	4	<b>Actinomycosis:</b>	
California.....	2,843	<b>Paratyphoid fever:</b>		Connecticut.....	1
Hawaii Territory.....	69	California.....	2	<b>Chickenpox:</b>	
Kansas.....	1,062	Plague, bubonic:		Arkansas.....	91
North Dakota.....	132	Hawaii Territory.....	1	Connecticut.....	690
Washington.....	901	<b>Puerperal infection:</b>		Delaware.....	94
Wisconsin.....	2,065	Alaska.....	1	<b>Conjunctivitis:</b>	
<b>Conjunctivitis:</b>		<b>Rabies in animals:</b>		Connecticut.....	5
Kansas.....	1	California.....	227	<b>Dysentery:</b>	
Washington.....	9	Washington.....	22	Arkansas (bacillary)....	2
<b>Dysentery:</b>		<b>Scabies:</b>		Connecticut (bacillary)..	1
California (amoebic)....	3	Kansas.....	4	<b>Encephalitis, epidemic or</b>	
California (bacillary)....	15	Washington.....	7	lethargic:	
Hawaii Territory (amoebic)	4	<b>Septic sore throat:</b>		Connecticut.....	2
Washington (bacillary)..	3	Alaska.....	2	<b>German measles:</b>	
<b>Encephalitis, epidemic or</b>		California.....	6	Connecticut.....	30
lethargic:		Hawaii Territory.....	2	Delaware.....	2
California.....	1	Kansas.....	13	<b>Mumps:</b>	
Kansas.....	1	Washington.....	9	Arkansas.....	41
Washington.....	2	Wisconsin.....	10	Connecticut.....	1,031
Wisconsin.....	1	<b>Tetanus:</b>		Delaware.....	136
<b>Food poisoning:</b>		California.....	5	<b>Ophthalmia neonatorum:</b>	
California.....	21	Hawaii Territory.....	3	Arkansas.....	1
<b>German measles:</b>		<b>Trachoma:</b>		<b>Paratyphoid fever:</b>	
California.....	72	Alaska.....	3	Connecticut.....	2
Kansas.....	12	California.....	8	<b>Rabies in animals:</b>	
North Dakota.....	1	Hawaii Territory.....	16	Arkansas.....	27
Washington.....	13	<b>Trichinosis:</b>		Connecticut.....	1
Wisconsin.....	62	California.....	15	<b>Rabies in man:</b>	
<b>Granuloma, coccidioidal:</b>		Typhus fever:		Arkansas.....	1
California.....	5	Hawaii Territory.....	3	<b>Septic sore throat:</b>	
<b>Hookworm disease:</b>		Undulant fever:		Arkansas.....	13
Hawaii Territory.....	2	California.....	18	Connecticut.....	27
<b>Impetigo contagiosa:</b>		Hawaii Territory.....	1	<b>Trachoma:</b>	
Alaska.....	2	Kansas.....	2	Arkansas.....	8
Hawaii Territory.....	13	North Dakota.....	1	<b>Trichinosis:</b>	
Kansas.....	1	Washington.....	3	Connecticut.....	4
Washington.....	15	Wisconsin.....	4	<b>Tularaemia:</b>	
<b>Jaundice, epidemic:</b>		<b>Vincent's infection:</b>		Arkansas.....	2
California.....	3	Kansas.....	9	<b>Undulant fever:</b>	
<b>Leprosy:</b>		North Dakota.....	7	Arkansas.....	1
California.....	1	Washington.....	1	Connecticut.....	5
Hawaii Territory.....	4	<b>Whooping cough:</b>		<b>Whooping cough:</b>	
<b>Mumps:</b>		Alaska.....	82	Arkansas.....	251
Alaska.....	57	California.....	1,750	Connecticut.....	209
California.....	1,641	Hawaii Territory.....	141	Delaware.....	41
Hawaii Territory.....	6	Kansas.....	461		
Kansas.....	853	North Dakota.....	115		

## WEEKLY REPORTS FROM CITIES

City reports for week ended Feb. 26, 1938

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
<b>Data for 90 cities:</b>											
5-year average.....	204	941	163	5,098	999	2,339	24	421	18	1,223	-----
Current week 1.....	161	197	45	12,937	758	1,678	26	371	17	1,007	-----
<b>Maine:</b>											
Portland.....	0	-----	0	3	2	0	0	0	0	13	21
<b>New Hampshire:</b>											
Concord.....	0	-----	0	2	2	0	0	0	0	0	12
Manchester.....	0	-----	2	0	2	27	0	1	0	0	20
Nashua.....	0	-----	0	0	1	0	0	0	0	0	7
<b>Vermont:</b>											
Barre.....	0	-----	0	1	-----	-----	-----	4	-----	-----	5
Burlington.....	1	-----	0	16	0	0	0	0	0	3	10
Rutland.....	0	-----	-----	0	-----	0	0	-----	0	0	10

1 Figures for Richmond, Va., estimated; report not received.

## City reports for week ended Feb. 26, 1938—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
<b>Massachusetts:</b>											
Boston.....	0		1	132	36	83	0	16	0	7	245
Fall River.....	0		0	0	2	1	0	1	0	14	31
Springfield.....	0		0	0	6	5	0	0	0	9	33
Worcester.....	0		0	2	4	19	0	1	0	12	46
<b>Rhode Island:</b>											
Pawtucket.....	0		0	0	1	5	0	0	0	0	21
Providence.....	0		0	3	13	7	0	2	0	21	69
<b>Connecticut:</b>											
Bridgeport.....	0		0	0	2	19	0	0	0	0	32
Hartford.....	0		0	1	2	22	0	3	0	0	51
New Haven.....	0		0	1	1	4	0	0	0	2	29
<b>New York:</b>											
Buffalo.....	0		0	2	9	32	0	3	0	0	134
New York.....	27		8	543	149	342	0	82	2	213	1,517
Rochester.....	0	3	0	10	5	11	0	1	0	2	76
Syracuse.....	0		0	20	7	7	0	3	0	14	61
<b>New Jersey:</b>											
Camden.....	3		0	51	1	0	0		1	1	31
Newark.....	1		0	14	9	22	0	3	0	24	94
Trenton.....	0		0	4	4	2	0	3	0	9	36
<b>Pennsylvania:</b>											
Philadelphia.....	8	8	3	615	37	121	0	23	0	19	518
Pittsburgh.....	3		0	397	21	39	0	9	1	17	164
Reading.....	0		1	4	2	2	0	1	0	2	34
Scranton.....	1			61		5	0		0	1	
<b>Ohio:</b>											
Cincinnati.....	4		0	3	8	9	0	7	0	8	132
Cleveland.....	2	12	2	257	19	44	0	20	0	54	195
Columbus.....	3		0	162	5	7	0	2	0	2	67
Toledo.....	2	2	1	146	2	4	1	2	0	23	65
<b>Indiana:</b>											
Anderson.....	0		0	14	0	5	2	1	0	1	9
Fort Wayne.....	0		0	43	1	4	0	0	0	2	22
Indianapolis.....	16		2	103	16	18	0	4	0	5	114
South Bend.....	0		0	8	5	3	0	0	0	0	25
Terre Haute.....	2		0	18	0	8	0	0	0	0	23
<b>Illinois:</b>											
Alton.....	0		0	1	2	6	0	1	0	0	4
Chicago.....	7	11	2	3,327	53	265	0	45	1	35	718
Elgin.....	0		0	3	2	7	0	0	0	0	6
Moline.....	1		0	55	2	11	0	0	0	1	6
Springfield.....	0		0	170	3	3	2	1	0	0	20
<b>Michigan:</b>											
Detroit.....	7		0	2,211	13	172	0	15	2	83	262
Flint.....	1		0	5	6	37	0	0	0	24	20
Grand Rapids.....	0		0	29	3	20	0	0	0	1	32
<b>Wisconsin:</b>											
Kenosha.....	0		0	1	0	0	0	0	0	21	7
Madison.....	0		0	0		5	0		0	0	15
Milwaukee.....	2	1	1	2,552	3	21	0	0	0	20	98
Racine.....	0		0	20	1	10	0	0	0	3	13
Superior.....	0		0	4	0	2	0	0	0	2	12
<b>Minnesota:</b>											
Duluth.....	0		0	0	3	5	0	0	0	4	30
Minneapolis.....	0		0	5	5	20	1	1	0	4	85
St. Paul.....	0		0	0	4	4	3	2	0	3	64
<b>Iowa:</b>											
Cedar Rapids.....	0			0		0	0		0	1	
Davenport.....	0			12		1	0		0	0	
Des Moines.....	0			2		32	0		0	0	26
Sioux City.....	0			0		3	0		0	3	
Waterloo.....	2			17		11	1		0	1	
<b>Missouri:</b>											
Kansas City.....	0		0	200	8	20	0	4	0	2	89
St. Joseph.....	0		0	32	2	4	0	0	0	0	26
St. Louis.....	8		0	27	12	39	2	5	0	7	234
<b>North Dakota:</b>											
Fargo.....	0		0	1	1	1	0	0	0	2	7
Grand Forks.....	0			1		0	1		0	0	
Minot.....	0		0	0		0	6		0	0	8
<b>South Dakota:</b>											
Aberdeen.....	0			0		2	0		0	2	
<b>Nebraska:</b>											
Lincoln.....	0			1		18	0		0	0	
Omaha.....	0		1	2	3	4	0	1	0	0	39

## City reports for week ended Feb. 26, 1938—Continued

State and city	Diph- theria cases	Influenza		Meas- les cases	Pneu- monia deaths	Scar- let fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths, all causes
		Cases	Deaths								
<b>Kansas:</b>											
Lawrence.....	0	2	0	0	1	0	0	0	0	1	5
Topeka.....	0		0	3	3	1	0	0	0	23	17
Wichita.....	0		0	4	11	2	0	3	0	5	40
<b>Delaware:</b>											
Wilmington.....	0		0	9	3	2	0	0	0	3	21
<b>Maryland:</b>											
Baltimore.....	4	14	1	2	27	33	0	7	0	34	222
Cumberland.....	0		0	0	1	2	0	1	0	1	15
Frederick.....	0		0	0	0	0	0	0	0	0	4
<b>Dist. of Columbia:</b>											
Washington.....	10	0	0	4	22	15	0	4	1	4	157
<b>Virginia:</b>											
Lynchburg.....	1		0	0	4	0	0	0	0	3	12
Norfolk.....	0	4	0	169	5	7	0	1	0	7	28
Richmond.....											
Roanoke.....	3		0	3	0	4	0	0	0	0	26
<b>West Virginia:</b>											
Charleston.....	0	2	0	189	1	0	0	0	0	8	7
Huntington.....	0			14		0	0		0	0	
Wheeling.....	0		0	0	8	0	0	1	0	0	36
<b>North Carolina:</b>											
Gastonia.....	0			4		0	0		0	3	
Raleigh.....	0		0	32	10	0	0	0	0	8	21
Wilmington.....	0		0	109	1	2	0	0	0	13	11
Winston-Salem.....	0		0	2	1	0	0	2	0	29	14
<b>South Carolina:</b>											
Charleston.....	0	29	0	117	1	0	0	0	1	0	21
Florence.....	0		0	27	0	0	0	1	0	0	15
Greenville.....	0		0	0	3	0	0	0	0	24	21
<b>Georgia:</b>											
Atlanta.....	0	8	1	173	15	6	0	3	0	5	88
Brunswick.....	0		0	0	0	0	0	0	0	0	4
Savannah.....	0	36	2	81	2	0	0	2	0	3	31
<b>Florida:</b>											
Miami.....	0		0	51	5	0	0	0	0	4	45
Tampa.....	3		0	6	0	3	1	0	0	0	24
<b>Kentucky:</b>											
Ashland.....	0			1		0	0		0	3	
Covington.....	0		0	1	0	4	0	2	0	0	21
Lexington.....	0	3	1	1	3	0	0	1	0	2	21
Louisville.....	1	1	0	128	9	45	0	8	0	9	66
<b>Tennessee:</b>											
Knoxville.....	2		0	44	2	2	0	1	2	2	24
Memphis.....	0		1	256	7	1	0	6	0	0	81
Nashville.....	0		0	127	4	3	0	1	0	8	41
<b>Alabama:</b>											
Birmingham.....	3	24	1	126	7	3	0	4	0	1	65
Mobile.....	0		1	8	2	0	0	0	0	0	26
Montgomery.....	0	1		87		0	0		0	2	
<b>Arkansas:</b>											
Fort Smith.....	0			22		1	0		0	0	
Little Rock.....	0		0	109	5	1	2	2	0	0	
<b>Louisiana:</b>											
Lake Charles.....	0		0	0	1	0	0	1	0	3	6
New Orleans.....	5	4	4	0	14	9	0	11	7	7	149
Shreveport.....	1		0	7	12	4	0	2	0	0	49
<b>Oklahoma:</b>											
Oklahoma City.....	1		0	0	6	5	1	0	0	0	44
Tulsa.....	0			0		3	9		0	0	
<b>Texas:</b>											
Dallas.....	4	4	4	6	6	10	0	4	0	8	87
Fort Worth.....	0		0	0	5	9	0	1	0	4	34
Galveston.....	1		0	0	1	2	0	3	0	0	18
Houston.....	1		0	0	11	7	0	2	1	0	96
San Antonio.....	3		2	0	12	0	0	5	0	0	77
<b>Montana:</b>											
Billings.....	0		0	1	5	1	0	1	0	0	13
Great Falls.....	0		0	0	1	0	1	0	0	2	7
Helena.....	0		0	0	1	3	0	0	0	4	6
Missoula.....	0	2	0	0	1	0	0	0	0	1	5
<b>Idaho:</b>											
Boise.....	0		0	1	1	1	3	0	0	0	3



## City reports for week ended Feb. 26, 1938—Continued

State and city	Diph- theria cases	Influenza		Meas- les cases	Pneu- monia deaths	Scar- let fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths, all causes
		Cases	Deaths								
Colorado:											
Colorado Springs.....	4	-----	0	0	4	4	0	3	0	2	21
Denver.....	5	-----	0	419	15	23	0	3	0	1	98
Pueblo.....	0	-----	2	0	3	2	0	0	0	1	16
New Mexico:											
Albuquerque.....	0	-----	0	8	2	3	0	2	0	5	10
Utah:											
Salt Lake City.....	0	-----	0	100	2	8	1	0	0	2	-----
Washington:											
Seattle.....	0	-----	1	2	3	3	1	0	0	50	95
Spokane.....	0	3	3	0	4	0	1	1	0	7	26
Tacoma.....	0	-----	0	0	3	7	2	0	0	18	36
Oregon:											
Portland.....	1	3	1	1	6	24	5	2	0	0	78
Salem.....	-----	3	-----	-----	-----	0	3	-----	0	0	-----
California:											
Los Angeles.....	10	30	0	10	19	39	6	23	0	14	352
Sacramento.....	2	-----	0	0	2	3	0	4	0	43	28
San Francisco.....	1	-----	1	2	14	15	0	10	0	34	194

State and city	Meningococcus meningitis		Polio- mye- litis cases	State and city	Meningococcus meningitis		Polio- mye- litis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Iowa:			
Worcester.....	1	1	0	Des Moines.....	1	0	0
Rhode Island:				Missouri:			
Providence.....	1	1	1	St. Louis.....	1	0	0
New York:				District of Columbia:			
Buffalo.....	1	0	0	Washington.....	0	0	1
New York.....	5	0	0	West Virginia:			
Syracuse.....	1	1	0	Charleston.....	1	1	0
Pennsylvania:				Alabama:			
Philadelphia.....	1	0	0	Birmingham.....	4	0	0
Ohio:				Arkansas:			
Cincinnati.....	2	0	0	Little Rock.....	0	1	0
Illinois:				Louisiana:			
Chicago.....	0	1	0	Shreveport.....	0	1	0
Moline.....	1	1	0	Colorado:			
Michigan:				Denver.....	1	1	0
Detroit.....	2	0	0	California:			
Minnesota:				Los Angeles.....	0	0	1
St. Paul.....	1	0	0				

*Encephalitis, epidemic or lethargic.*—Cases: New York, 1; Milwaukee, 1; New Orleans, 1.

*Pellagra.*—Cases: Wichita, 1; Atlanta, 2; Savannah, 2; Tampa, 1; Birmingham, 7; San Francisco, 1.

*Rabies in man.*—Deaths: Houston, 1.

*Typhus fever.*—Cases: Charleston, S. C., 1; Savannah, 1; Montgomery, 1.

## FOREIGN AND INSULAR

### BELGIUM

*Vital statistics—Year 1936.*—Following are vital statistics for Belgium for the year 1936:

	Num- ber	Rate per 1,000 inhabi- tants		Num- ber	Rate per 1,000 inhabi- tants
Total deaths.....	106,190	12.75	Deaths from—Continued.		
Deaths under 1 year.....	9,953	17.85	Influenza.....	1,915	0.230
Deaths from:			Malaria.....	12	.001
Alcoholism.....	111	.013	Measles.....	336	.040
Appendicitis.....	689	.083	Meningitis (nontubercular).....	907	.109
Cancer and other malignant tumors.....	9,166	1.100	Nephritis.....	2,668	.320
Cerebral hemorrhage.....	8,398	1.008	Pneumonia.....	7,037	.845
Diabetes mellitus.....	1,589	.191	Scarlet fever.....	124	.015
Diarrhea and enteritis (under 2 years of age).....	931	.112	Septicemia and puerperal infections.....	199	.024
Diarrhea and enteritis (2 years and over).....	257	.031	Syphilis.....	39	.005
Diphtheria.....	377	.045	Tuberculosis (all forms).....	5,992	.719
Heart disease.....	17,707	2.125	Typhoid fever and para- typhoid fever.....	97	.012
			Whooping cough.....	433	.052

<sup>1</sup> Per 100 live births.

### DENMARK

*Notifiable diseases—October–December 1937.*—During the months of October, November, and December, 1937, cases of certain notifiable diseases were reported in Denmark as follows:

Disease	October	No- vember	De- cember	Disease	October	No- vember	De- cember
Cerebrospinal meningitis.....	3	4	2	Poliomyelitis.....	265	63	17
Chickenpox.....	38	73	112	Puerperal fever.....	16	21	20
Diphtheria and croup.....	142	153	107	Scabies.....	1,679	1,808	1,529
Epidemic encephalitis.....	3	3	3	Scarlet fever.....	1,491	1,488	1,013
Erysipelas.....	261	268	277	Syphilis.....	66	53	53
German measles.....	5	29	19	Tetanus, neonatorum.....	4	2	3
Gonorrhea.....	953	912	687	Tetanus, traumatic.....	1	1	1
Influenza.....	4,689	4,818	5,494	Typhoid fever.....	4	2	1
Malaria.....	5	7	11	Undulant fever (Bact. abort. Bang).....	42	54	35
Measles.....	479	1,192	2,353	Weil's disease.....	8	3	---
Mumps.....	338	536	705	Whooping cough.....	664	964	877
Paratyphoid fever.....	21	13	3				

## FINLAND

*Communicable diseases—January 1938.*—During the month of January 1938, cases of certain communicable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Diphtheria.....	291	Pollomyelitis.....	13
Influenza.....	3,329	Scarlet fever.....	853
Lethargic encephalitis.....	1	Typhoid fever.....	18
Paratyphoid fever.....	17	Undulant fever.....	1

## GERMANY

*Vital statistics—Third quarter 1937.*—Following are vital statistics for Germany for the third quarter of 1937:

Number of marriages.....	152,839
Number of live births.....	306,250
Number of live births per 1,000 population.....	18.1
Number of stillbirths.....	7,028
Total deaths.....	170,931
Deaths per 1,000 population.....	10.1
Deaths under 1 year of age.....	17,414
Deaths under 1 year of age per 100 live births.....	5.5

## JAMAICA

*Communicable diseases—4 weeks ended February 19, 1938.*—During the 4 weeks ended February 19, 1938, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chickenpox.....	64	19	Puerperal fever.....		1
Diphtheria.....	1	2	Tuberculosis.....	29	83
Dysentery.....	2	3	Typhoid fever.....	7	64
Erysipelas.....		3			

## NEWFOUNDLAND AND LABRADOR

*Vital statistics—Year 1936.*—The following table shows the births, and deaths from certain causes in Newfoundland and Labrador for the year 1936:

	Num-ber	Rate per 1,000 popu-lation		Num-ber	Rate per 1,000 popu-lation
Births.....	7,342	25.2	Deaths from—Continued.		
Total deaths.....	3,802	13.0	Measles.....	40	
Deaths under 1 year of age.....	826	112.7	Puerperal causes.....	46	16.3
Deaths from:			Scarlet fever.....	1	
Cancer.....	278	.954	Tuberculosis.....	577	1.98
Diphtheria.....	19		Typhoid fever.....	10	
Dysentery.....	26		Whooping cough.....	96	
Influenza.....	54				

<sup>1</sup> Per 1,000 live births.

## SWEDEN

*Notifiable diseases—January 1938.*—During the month of January 1938, cases of certain notifiable diseases were reported in Sweden as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis.....	9	Poliomyelitis.....	<sup>1</sup> 41
Diphtheria.....	25	Scarlet fever.....	1,845
Dysentery.....	1	Syphilis.....	25
Epidemic encephalitis.....	2	Typhoid fever.....	3
Gonorrhea.....	532	Undulant fever.....	18
Paratyphoid fever.....	6	Well's disease.....	2

<sup>1</sup> Includes 2 cases nonparalytic at time of notification.

## CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for February 25, 1938, pages 313-327. A similar cumulative table will appear in future issues of the PUBLIC HEALTH REPORTS for the last Friday of each month.

## Cholera

*India—Vizagapatam.*—During the week ended February 26, 1938, 1 case of cholera was reported in Vizagapatam, India.

*Indochina (French).*—During the week ended February 26, 1938, 54 cases of cholera were reported in Annam Province, and 14 cases in Tonkin Province, French Indochina.

## Typhus Fever

*On vessel—S. S. Blackhill.*—On January 22, 1938, 1 case of typhus fever was reported on the *S. S. Blackhill* at Philippeville, Algeria. The patient died on February 6, 1938.

## Yellow Fever

*Belgian Congo—Saratumba.*—On February 27, 1938, 1 suspected case of yellow fever was reported in Saratumba, near Zongo, Belgian Congo.

*Brazil.*—Yellow fever was reported in Brazil as follows: *Minas Geraes State*—Bicas, January 29, 1938, 1 death, February 2, 2 deaths, February 3, 1 death, first appearance; Juiz de Fora, February 1, 1 death, February 2, 1 death, February 3, 1 death, February 4, 1 death, February 6, 1 death; Machado, February 1, 1 death; Mercedes, January 31, 1 death, first appearance; Rio Novo, February 6, 1 death; Sao Joao Nepomuceno, February 2, 1 death, first appearance. *Para State*—Cameta, January 20, 1 death. *Rio de Janeiro State*—Areal, January 28, 1 death, first appearance; Vassouras, January 30, 1 death, February 1, 1 death, first appearance. *Santa Catharina State*—Hansa, February 3, 1 death, first appearance.

*Ivory Coast—Abidjan.*—On February 19, 1938, 1 suspected case of yellow fever was reported in Abidjan, Ivory Coast.

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